

## **REMARKS**

Applicant would like to thank the Examiner for the careful consideration given the present application. The application has been carefully reviewed in light of the Office action, and amended as necessary to more clearly and particularly describe the subject matter which applicant regards as the invention.

Claims 12 – 15, 30, and 31 were rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,303,880 to Asai et al. (hereinafter, "Asai") in view of U.S. Patent Publication No. 2004/0080052 to Ou et al. (hereinafter, "Ou"). The rejections are traversed for the following reasons.

The invention defined in claim 12 is directed to a circuit board in which a circuit portion is formed on an insulating substrate by a conductive layer. A through hole and/or a non-through hole are provided through the insulating layer. The internal wall of the hole is covered or filled with the conductive layer and the land of the hole is formed continuously like a concentric circle with respect to the hole. A maximum height of the conductive layer in a non-coupling portion of the land is greater than or equal to 5 $\mu$ m. The maximum height of the conductive layer in the non-coupling portion is smaller than or equal to a thickness of the conductive layer in a circuit portion. With a corner portion of the insulating substrate set as a reference point, a land width from the reference point is 0 to 40 $\mu$ m. Further, claim 12 has been amended so as to define that the land width falls between a maximum value and a minimum value, where a difference between the maximum value and the minimum value is equal to or less than 8 $\mu$ m and greater than 0 $\mu$ m.

Asai was cited for teaching the general structure of the circuit board of claim

12, including all of the defined dimensional features, save the maximum height of the conductive layer in the non-coupling portion of the land. For this feature, the Examiner cited to Ou. Further, in supporting the rejection of claim 13, the Examiner stated that Asai teaches a constant land width and therefore teaches a difference between maximum and minimum land widths as zero.

As amended, claim 12 now requires a difference in the minimum and maximum values of the land width. Specifically, the difference between maximum and minimum values of the land width, as defined by claim 12, is greater than  $0\mu\text{m}$  and less than  $8\mu\text{m}$ . Accordingly, to teach or suggest this feature of claim 12, the art must teach some variation between the maximum and minimum values of the land width so as to provide a difference between maximum and minimum values.

However, Asai only teaches a land width that is symmetrical and constant around the through hole. As such, Asai only teaches that a difference between maximum and minimum land width values is zero. Thus, Asai fails to teach or suggest a difference in the land width around the through hole, as required by claim 12. Similarly, Ou is silent as to this feature.

Accordingly, the combined references fail to teach or suggest a land having a land width that "falls between a maximum value and a minimum value, [wherein] a difference between the maximum and minimum values is equal to or less than  $8\mu\text{m}$  and greater than  $0\mu\text{m}$ ", as required by claim 12. For this reason alone, the combined references fail to render claim 12 obvious.

Additionally, contrary to the Examiner's assertion, it is submitted that Ou does not suggest the claimed maximum height of the conductive layer in the non-coupling portion of the land. In this regard, it is noted that Ou discloses a thin copper film

having a thickness of 5  $\mu\text{m}$  formed on an inner wall (442) of a via (440) and surfaces (412, 414) of an insulating layer (410). Ou, paragraph [0027] and Fig. 5F. However, claim 12 requires that a maximum height of the conductive layer in a non-coupling portion of the land (as shown in Fig. 70) is equal to or greater than 5  $\mu\text{m}$  and is equal to or smaller than a thickness of the conductive layer in a circuit portion.

In this regard, Ou does not teach or suggest a non-coupling portion of a land, and consequently does not teach or suggest the claimed maximum height of the conductive layer in the non-coupling portion of the land. As noted by the Examiner, Asai also fails to disclose this feature. Accordingly, for this additional reason, it is submitted that the combined references fail to teach or suggest each and every feature of claim 12, and therefore do not render claim 12 obvious.

Thus, for the above reasons, a *prima facie* case of obviousness in support of the rejection of claim 12 has not been established. Accordingly, reconsideration and withdrawal of the rejection of claim 12 is requested. Claims 14 and 15 depend from claim 12 and are also considered allowable over the art. Claims 13, 30, and 31 have been cancelled, rendering the rejection of those claims moot.

In light of the foregoing, it is respectfully submitted that the present application is in a condition for allowance and notice to that effect is hereby requested. If it is determined that the application is not in a condition for allowance, the Examiner is invited to initiate a telephone interview with the undersigned attorney to expedite prosecution of the present application.

If there are any additional fees resulting from this communication, please charge same to our Deposit Account No. 18-0160, our Order No. NGB-16837.

Respectfully submitted,

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